

Response to Office Action of 10/3/2003
Appl. Ser. No. 09/945,385

REMARKS

Reconsideration of the application is requested in view of the following remarks. All of the claims have been amended. As illustrated by the arguments which follow, no amendments have been made in order to distinguish prior art. Rather, the amendments have been made to incorporate preferred transitions under U.S. patent practice, provide antecedent bases for all claims terms, and otherwise clarify the scope of the claims. Accordingly, no new matter has been entered as a result of these amendments.

Claim 1 was rejected under 35 U.S.C. § 102 as anticipated by Wright (U.S. Pat. No. 2,890,548). Claims 1-8 were rejected under 35 U.S.C. § 103 as obvious over Wright. The Applicants respectfully traverse these rejections. Claim 1 requires that the gas stream be "interrupted between two sequential pulses."

Wright teaches the introduction of gas into a molten mass; however, Wright fails to teach that the gas stream is interrupted between two sequential pulses as required by claim 1. At all times the gas pressure of the bubbler nozzles taught by Wright exert a positive pressure in order to prevent the molten glass from entering the bubbler nozzle 13. (Col. 3, ll. 27-36). While the high-pressure gas stream is intermittently shut off, the low-pressure gas is constantly supplied. (Col. 4, ll. 12-15). Wright teaches that this constant positive pressure is necessary in order to prevent the molten glass from entering and solidifying in the bubbler nozzle 13, a very inconvenient and costly problem to fix. (Col. 3, ll. 27-57). Thus, Wright teaches away from the interruption of the gas stream as required under claim 1.

Since there is no interruption of the gas stream in the process taught by Wright, and the pressure of the gas stream never reaches zero, the process taught by Wright is incapable of producing the small bubbles desired under the current invention. The constant positive pressure would prevent bubbles from coming free from the nozzle until they reach a sufficiently large size, as there is no quick reduction of pressure. As taught in the written description of the current invention, a sharp decline in pressure is necessary to produce smaller bubbles. (See p. 3, second paragraph).

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Moreover, there is no motivation to modify the process taught by Wright in the manner claimed. The Wright process uses the bubble stream to create convection currents in order to maintain the molten mass at a consistent temperature throughout. (See Col. 5, ll. 23-34; Fig. 2). As taught by Wright, the convection currents created by the bubbles cause the molten glass near the floor layer to move up into the high layers having a higher temperature. This increases the furnace output and creates a more homogenous glass. (Col. 5, ll. 32-34). Wright teaches the advantages of creating bubbles having an increased size because larger bubbles create stronger convection currents. (Col. 2, ll. 17-20). Thus, Wright teaches away from the use of smaller bubbles. Accordingly, there is no motivation to interrupt the gas stream as required by claim 1.

Contrary to the teachings of Wright, however, the current invention aims to produce bubbles of a smaller size. A smaller-sized bubble has a larger surface-area/volume ratio which allows the bubble to take up more foreign gases because the bubble has a slower ascent. (See p. 2, third full paragraph). In order to produce bubbles having a smaller size, claim 1 requires the interruption of the gas stream between two sequential pulses. As expressed in the written description, "a pressure free phase absolutely must be present" between each pulse of the gas stream. (See p. 3, first paragraph). The next pressure pulse can follow only after the bubble has left the area of the nozzle. (See p. 3, first paragraph).

For at least the reason that Wright fails to teach, or even suggest, the interruption of the gas stream as required under claim 1, Wright fails to render claim 1 obvious. Claims 1-8 depend from claim 1, an allowable base claim. For at least this reason, Wright fails to render these claims obvious as well.

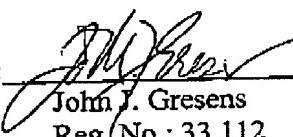
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In view of the above, the Applicants respectfully request reconsideration of the application in the form of a Notice of Allowance.

Respectfully submitted,

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